

# Does Financial Sector Development Promote Economic Growth in Pakistan?

## An Empirical Analysis Using ARDL Technique

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### Abstract

The primary objective of this study is to empirically assess the role of financial sector development that is needed to accelerate economic growth in Pakistan. The data of concern variables have been taken from statistical year book of Pakistan and federal bureau of statistics of Pakistan, time span from 1975 to 2013. To test empirically, **Autoregressive and distributive lag model (ARDL)** is applied to extract the relationship among variables (Gross domestic product, liquid liability, domestic credit and demand deposits). Results of the study confirm that these variables exhibit long run and short run behavior in the economy. Error correction model identify that the speed of adjustment is moderate to attain the equilibrium condition.

**Keywords:** Financial development, Domestic credit, Demand deposit, Liquid liability, ARDL

### 1. Introduction

Financial sector development is primarily concern with private sector in developing and emerging countries to accelerate the role of private sector in achieving economic goals such as increase output, productivity and reducing inequality and poverty. Financial sector consists of different institutions, financial instruments, markets and comprehensive legal structure necessary for functioning financial sector that allows transactions in a financial sector is to be made by extending credit<sup>1</sup>. Fundamentally, the objective of financial sector development is to achieve gained by overcoming “costs”. By reducing the costs of transactions such as the cost of collecting information, imposing contracts as well as making transactions ensued in the appearance of financial contracts, markets, and intermediaries. A modern financial system encourages investment by recognizing and funding good business opportunities, mobilizes, savings, monitors the performance of managers, enables the trading, hedging, and diversification of risk, and facilitates the exchange of goods and services. These functions result in a more efficient allocation of resources, in a more rapid accumulation of physical and human capital<sup>2</sup>, and in faster technological progress, which in turn feed economic growth. Development in financial sector can be seen when different functioning units of financial sector provide ease of use of information collected and other tasks. This development will help to provide a sound financial system which leads to economic development in any country.<sup>3</sup> It is a common consensus among policy makers that well-functioning combination of financial sector such as efficient activities of commercial banks, investment banks and stock exchanges and other concern institutions will accelerate economic growth and helpful to other sectors for their growth. The importance of financial sector development is responsible to think about issues which are the responsible for weak performance, its connection with economic development and need to reformulate the policies and regulation. Globally, differences in legal and accounting systems among countries are considerable determinants in explaining or evaluating financial sector development process. Specifically, economies with rules and procedures that provide creditors priority in getting their entitlements on corporations, motivate to disclose more comprehensively effective and accurate financial reports and statements, and how efficiently implementing compliance with financial rules and regulations for better functioning financial systems. Furthermore, efficient procedure of contract enforcement, such as, property rights, is even more significant than the formal regulatory code in financial development<sup>4</sup>. Moreover, it is observed that those countries which developed their financial sector have a tendency to grow faster in the long run. Several empirical studies suggest that the effect of financial development on economic growth is causal: results of several studies identify that financial development contributes to economic growth rather than it is the result of economic growth. Furthermore, as well as for poverty reduction and reducing inequality, financial sector development will improve the effectiveness of social development policies by easing the channels that provide facility to vulnerable people to access the finance for their need and increasing their productivity to maximize their satisfaction which increases social welfare. In literature, it is observed that small and medium enterprises grow faster than large scale firms in developing countries. These SMEs are playing significant role in output generation. To promote SMEs, financial sector

<sup>1</sup> **Extending Credit** An extra-long credit used by commercial banks borrowing from the Federal Reserve Read more: [http://www.investorwords.com/9647/extended\\_credit.html#ixzz4Np9ILCsS](http://www.investorwords.com/9647/extended_credit.html#ixzz4Np9ILCsS)

<sup>2</sup> **Human capital:** The collective skills, knowledge, or other intangible assets of individuals that can be used to create economic value for the individuals, their employers, or their community.

<sup>3</sup> [https://en.wikipedia.org/wiki/Financial\\_sector\\_development](https://en.wikipedia.org/wiki/Financial_sector_development)

development is the life blood to achieve economic goals through their developments. The above discussion give the picture that financial sector development is not just to provide services as financial intermediaries, it links with overall economic system globally. The recent global financial crises is responsible to show weak aspects of financial sector and there is a need to work for better financial system globally after the disastrous consequences. The crisis has challenged conventional thinking in financial sector policies and has led to much debate on how best to achieve sustainable development.<sup>1</sup> The objective of the present study is to examine the role of financial sector development in case of Pakistan to promote sustainable economic growth which leads to economic development, because economic growth is an engine to developed economy.

Present study is decomposed into different sections. Section 1 discuss the introduction. Section 2 discuss the related literature review. Section 3 explains the data and methodology. Section 4 of the present study comprise of results and discussion. Similarly section 5 represents the conclusion.

## 2. Literature Review

Muhammad Shahbaz et.al. (2011) found that there exist a long-run association among variables included in the study such as exports, economic growth and financial development (FD) with reference to Pakistan. It is also concluded that both financial development and economic growth are significantly increases the export of Pakistan. It is also found that by using Granger Causality test, economic growth and financial development are related in bidirectional way.

Ghulam Shabbir et.al (2012) investigated the relationship between financial sector development (FSD) and unemployment in case of Pakistan. The study revealed that then exist a long-run relationship between FSD and unemployment. Auto Regressive Distributed Lag (ARDL)<sup>2</sup> is used for the estimation of long run relationship. Annual data used were from the period of 1973 to 2007. The study also examined that money in circulation has significant negative impact on employment rate. Similarly, it is also found that increased financial sector activities have significantly positive impact on unemployment.

Muhammad Shahbaz (2013) attempted to empirically analyze the relationship among variables such as financial development, saving and poverty using data related to Pakistan. In this study the (VECM)<sup>3</sup> Granger causality is used to confirm the short-run as well as long-run relationship among variables. Ng-Perron unit root test is used to handle the Unit root problem. The result of this study indicates that in long-run relationship found between variables such as financial development and poverty reduction but the results of short-run analysis exhibit significant strong causality is running from poverty reduction to the financial development.

Shahbaz, M. (2013) conducted an empirical study to find the relationship among income equality, economic growth and financial development in case of Pakistan. The study utilizes ARDL econometric technique to extract the information related to the relationship among variables. This study has check the relationship at three stages. In stage one the study considered financial development, financial instability and economic growth. In the second stage, the study considers financial development, uncertainty and income inequality. In stage three, the study utilizes financial development financial instability and poverty via economic growth. Findings of the study found that there exist the long-run association among variables of concern. Furthermore, the study also explored further that financial development and economic growth are significantly positively related whereas financial instability in Pakistan put significant negative impact on economic growth. In addition to this, the study further conclude that financial development has significant negative impact on income inequality in case of Pakistan. The study concludes that if financial development improves, it will improve income distribution and decreases income inequality.

Abdur Rehman et.al. (2013) analyzes the long-run and spontaneous relationships between financial intermediation and real sector growth in Pakistan. In which annual time series data was used from 1972-2011 in which 40 annual observations are taken and all variables are in logarithmic form. Econometric methodology is used to find finance growth relationships. Unit root test is also used to avoid spurious result. Augmented Dickey-Fuller (ADF)<sup>4</sup> and Phillips-Peron (PP), co-integration test used that examines long-run relationship among

<sup>1</sup> World Bank. 2012. Global Financial Development Report 2013: Rethinking the Role of the State in Finance. World Bank, Washington, DC (<http://www.worldbank.org/financialdevelopment>)

<sup>2</sup> **ARDL**: In statistics and econometrics, a distributed lag model is a model for time series data in which a regression equation is used to predict current values of a dependent variable based on both the current values of an explanatory variable and the lagged (past period) values of this explanatory variable.  
([https://en.wikipedia.org/wiki/Distributed\\_lag](https://en.wikipedia.org/wiki/Distributed_lag))

<sup>3</sup> **VECM**: "A vector error correction (VEC) model is a restricted VAR that has co-integration restrictions built into the specification, so that it is designed for use with nonstationary series that are known to be co-integrated."  
([https://en.wikipedia.org/wiki/Error\\_correction\\_model](https://en.wikipedia.org/wiki/Error_correction_model))

<sup>4</sup> **Augmented Dickey-Fuller test (ADF)**: In statistics and econometrics, an augmented Dickey-Fuller test (ADF) tests the null hypothesis of whether a unit root is present in a time series sample. The alternative hypothesis is different depending on which version of the test is used, but is usually stationarity or trend-stationarity.

variables under integrated series.

Sharafat Ali et.al. (2014) analyzed the financial development and growth in Pakistan for the period of 1972-2011. Co-integration techniques and Granger causality test based on the block exogeneity (Wald test) which has been applied for the analysis. The long run relationships accepted among the inflation, credit to private sector, deposits, foreign direct investment, domestic savings and economic growth. The current study supports the “supply leading” theory in Pakistan economy. In this study the result of Granger causality test shows that there is bidirectional connection between inflation and growth, deposits and growth, and savings and growth. Moreover, unidirectional causality is running from foreign direct investment to growth. The amount of the error correction is statistically important and has the correct sign.

### 2.1 Summary of the Literature Review

Sr.No	Author	Year	Country	Techniques	Result
1.	Muhammad Shahbaz and Mizanur Rahman	2011	Pakistan	ARDL, Granger Causality	It is investigated that financial development and economic growth increases the export of Pakistan. It is also found that economic growth and financial development is related in bidirectional way.
2.	Ghulam Shabbir	2012	Pakistan	Unit root test, Granger Causality	Money in circulation has significant negative impact on employment rate. Similarly, it is also found that increased financial sector activities have significantly positive impact on unemployment.
3.	Muhammad shahbaz, Talat afza, Muhammad shahbaz shabbier	2013	Pakistan	Error Correction model, Granger causality	In long run response effect is occurred between financial development and poverty reduction but in short run strong causality is running from reduction in poverty to financial development.
4.	Muhammad Shahbaz	2013	Pakistan	ARDL Bound testing,	There are positive relationships between financial development and economic growth, financial instability has negative impact on economic growth directly but it also negatively affects the finance growth. Negative impact of financial development on income inequality has been found.
5.	Abdur Rehman, Dr. Ahmed Raza Cheema	2013	Pakistan	Econometric methodology, Unit root test, Augmented Dickey-Fuller (ADF) and Phillips-Peron (PP)	The result show a single co-integration relationship among the variables of financial intermediation and real sector growth.
6.	Sharafat Ali et.al	2014	Pakistan	Co-integration, Granger causality, Wald test	Granger causality test shows that there is bidirectional connection between inflation and growth, deposits and growth, and savings and growth. Moreover, unidirectional causality is running from foreign direct investment to growth.

### 3. Econometric methodology:

In order to develop econometric methodology, the present study utilizes an ARDL technique to evaluate the relationship among variables. This technique is simple and more effective than other techniques to examine the long-run and short-run behavior among variables. For the purpose of measuring, most studies extensively used “Standard Johanson Cointegration” and “Vector Error Correction Model” skeleton, but these frameworks

([https://en.wikipedia.org/wiki/Augmented\\_Dickey%E2%80%93Fuller\\_test](https://en.wikipedia.org/wiki/Augmented_Dickey%E2%80%93Fuller_test))

experience some considerable faults.

We used ARDL technique to set up the course of dependency among parameters. One of the advantages of this technique is that this test does not engage in pretesting of variables, this suggests that an empirical test for the concern variables is appropriate without worrying about whether the considering variables are purely integrated at the level I (0), integrated of I (1), or a combination of both.

For the purpose of obtaining robust results, we make use of the ARDL technique to set up the existence of a long run and short run association among variables. ARDL is enormously helpful because it enables us to explain the presence of convergence among variables without losing long run information. Equation to be estimated is as follows

$$GDP_t = \beta_1 LL_t + \beta_2 DC_t + \beta_3 t + \beta_4 DD_t + u_t \quad (1)$$

Where,

$GDP_t (X_4)$  = Gross Domestic Product

$LL_t (X_1)$  = Liquid Liability

$DC_t (X_4)$  = Domestic Credit

$DD_t (X_5)$  = Demand Deposit

$u_t$  = disturbance term

An ARDL demonstration of equation 1 is as follows

$$\Delta GDP_t = \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta GDP_{t-i} + \sum_{i=0}^n \alpha_{2i} \Delta DC_{t-i} + \sum_{i=0}^n \alpha_{3i} \Delta LL_{t-i} + \sum_{i=0}^n \alpha_{4i} \Delta DD_{t-i} + \beta_1 GDP_{t-1} + \beta_2 DC_{t-1} + \beta_3 LL_{t-1} + \beta_4 DD_{t-1} + e_t \quad (2)$$

Where,

$\Delta$  denotes the first difference operator

$\alpha_0$  is the drift component

$e_t$  is usual white noise residual

The equation-2 also represents the technique of short run and long run estimation. First six expressions of the equation on the left hand side shown as ( $\alpha_0$  to  $\alpha_6$ ) represents short run dynamics and expression shown as ( $\beta_1$  to  $\beta_6$ ) represents the long run dynamics of the model.

#### 4. Empirical results and discussion:

Table -1 include the result of autoregressive distributed lag estimates using (SBC) Schwarz Bayesian Criterion. By using this estimation, the study confirms about the lag selection which are needed for the empirical estimation. Table no. 1 represents that the GDP with five lags, LL with five lags, DC with four lags and DD with three lags is appropriate model for investigating the relationship among variables of concern. The table no.1 also highlighted the diagnostic results regarding serial correlation and heteroscedasticity. By analyzing the table, we can confirm that we fail to reject the hypothesis of no serial correlation as the probability 0.863 is more than 1%, 5% and 10% level of significance (based on the F - statistic). Similarly, we fail to reject the presence of heteroscedasticity by seeing the probability of 0.267 (based on the F - statistic). R-Squared indicates the fraction of change in dependent variable due to explain part of the regression. Our chosen empirical model specification shows that the GDP is 99 percent explained by the selected independent variables. Probability of F-statistic is 0.000 showing that overall model is significant.

Table-2 represents the results of estimated long run coefficients to quantify the long run behavior of variables using ARDL Approach. Our model explored that in the long run liquid liability, domestic credit and demand deposit are jointly responsible for changing in gross domestic product. All these independent variables are significant at 5% and 1% level of significance.

Table-3 revealed the short run dynamics of concern variables. The Second task of the analysis is to calculate the short run behavior of variables. This short run behavior is calculated by error correction model (ECM). The above table gave the picture that in short run LL, DC and DD are responsible for stabilizing the relationship again in equilibrium condition. The error correction term (ECT) is significant at 1% level and shows causality in at least one direction. The lagged error term (ECMt-1) in our model is calculated as -0.23392 is negative and highly significant. The coefficient of (ECT-1) indicates moderate rate of convergence to equilibrium, which implies that deviation from the long-term equilibrium is corrected by 56.33% over each year. The lag length of the short-run model is selected on basis of the SBC.

#### 5. Conclusion

This study concludes that a long run relationship exists between financial development and economic growth. Deposits can play an important role in economic growth these deposits are made to deposit accounts such as savings accounts, checking accounts and money market accounts. The results of the study confirms that economic growth depends upon financial developments. So, Government of Pakistan should take the necessary steps to increase the financial development due to which economic growth will increase.

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Table no.1: Autoregressive Distributed Lag Estimates  
ARDL (5, 5, 4, 3) selected based on Schwarz Bayesian Criterion

variables	Coefficient	Standard Error	T-Ratio[Prob]
X4 (-1)	.67644	.10394	6.5081 [.000]
X4 (-2)	-.71803	.11087	-6.4761 [.000]
X4 (-3)	.95366	.13618	7.0031 [.000]
X4 (-4)	-.83389	.13099	-6.3660 [.000]
X4 (-5)	-.21232	.11644	-1.8235 [.079]
X1	-.40093	.28371	-1.4132 [.169]
X1 (-1)	-.73965	.28947	-2.5552 [.016]
X1 (-2)	3.9860	.51278	7.7735 [.000]
X1 (-3)	-3.6057	.76927	-4.6871 [.000]
X1 (-4)	.056888	.56719	.10030 [.921]
X1 (-5)	1.2493	.44458	2.8101 [.009]
X2	.81689	.20464	3.9919 [.000]
X2 (-1)	-1.1725	.31174	-3.7612 [.001]
X2 (-2)	-1.0237	.30503	-3.3559 [.002]
X2 (-3)	2.9461	.49106	5.9996 [.000]
X2 (-4)	-.87376	.47066	-1.8565 [.074]
X5	.77658	.24639	3.1518 [.004]
X5 (-1)	-.38720	.20777	-1.8636 [.073]
X5 (-2)	-.77121	.21289	-3.6226 [.001]
X5 (-3)	6.1074	.55151	11.0740 [.000]
C	1406.1	5804.7	.24223 [.810]
T	575.3269	363.6034	1.5823 [.125]
Heteroscedasticity			1.2589 [.267]
Serial Correlation			.030161 [.863]
R-Squared	.99999	R-Bar-Squared	.99998
S.E. of Regression	9777.6	F-stat.	F( 21, 28) 112641.2 [.000]
DW-statistic	1.9541		

Table no.2: Estimated Long Run Coefficients using the ARDL Approach  
 ARDL(5,5,4,3) selected based on Schwarz Bayesian Criterion

Variables	Coefficient	Standard Error	T-Ratio[Prob]
X1	.48144	.25270	1.9052 [.067]
X2	.61112	.16542	3.6943 [.001]
X5	5.0484	.59061	8.5479 [.000]
C	1239.8	5157.8	.24037 [.812]
T	507.2841	294.9493	1.7199 [.096]

Table no.3 Short Run Coefficients Using ARDL Approach

Variables	Coefficient	Standard Error	T-Ratio[Prob]
dX1	1.6866	.37790	-4.4630 [.000]
dX2	.81689	.20464	3.9919 [.000]
dX5	.77658	.24639	3.1518 [.004]
dC	1406.1	5804.7	.24223 [.810]
dT	575.3269	363.6034	1.5823 [.124]
ecm(-1)	-.56321	.15117	-7.5022 [.000]